

REMARKS

Claim Amendments

Claim 19 has been canceled without prejudice.

Independent claims 1, 23, 24, and 27 have been amended to incorporate the limitation “wherein the multiwall thermoplastic sheet comprises a plurality of sections having a relative standard deviation in mass per unit area of less than about 2%”.

Support for this limitation can be found in claim 19 as filed.

Obviousness Rejection over Vetter + McCloskey + Numrich

Claims 1, 4-11, 13-15, 18-20, 23, 24, and 27 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over U.S. Patent No. 4,707,393 to Vetter (“Vetter”) in view of U.S. Patent No. 6,184,335 to McCloskey et al. (“McCloskey”) and U.S. Patent 6,613,264 to Numrich et al. (“Numrich”). 06/22/2007 Office Action, page 2, last full paragraph. Applicants respectfully traverse the rejection to the extent it may be applicable to the claims as currently amended.

Vetter generally describes a plastic multilayer multiple-wall panel, manufactured by the coextrusion of a plurality of adhesively bonded layers of thermoplastically extrudable synthetic resins by means of a multicomponent extrusion die. Vetter abstract. Vetter provides no useful guidance on selecting a polycarbonate resin, other than to mention the bisphenols from which all aromatic polycarbonates are prepared and to make a statement of circular reasoning about selecting the polycarbonates that work in the invention:

The polycarbonate resin usually is derived from an aromatic bisphenol or from a mixture of such bisphenols, and more particularly from bisphenol A. All polycarbonate resins which can be extruded into panels of high toughness and transparency are suited for use as materials for both the core layer and the UV absorption layer.

Vetter, col. 3, ll. 1-6. Note that the description of bisphenol type could apply to either an interfacial or melt process for polycarbonate production. Thus, Vetter does not teach or

suggest the use of a melt polycarbonate, let alone a melt polycarbonate having a Fries content of about 10 ppm to about 2000 ppm.

McCloskey generally describes salts of aryl sulfonic acids, such as alkali metal salts of p-toluenesulfonic acid, that are useful in catalyst systems in melt polymerizations, particularly melt polymerizations to form polycarbonates. McCloskey abstract. McCloskey also describes polycarbonates prepared using the catalyst systems. *Id.* McCloskey notes that polycarbonates having a number average molecular weight of about 25,000 to about 30,000 are preferred for sheet materials. McCloskey, col. 5, ll. 45-50. McCloskey does not mention multiwall sheet.

Numrich generally describes processing of polycarbonate-containing injection molding materials into optically isotropic films in a chill roll extrusion method. Numrich abstract. The optically isotropic films are used as covering films for protecting data carriers (CD-ROMS) from becoming scratched, or they are used as supporting materials for the information layer. *Id.* Numrich's films have a thickness less than 200 micrometers. Numrich, col. 2, lines 24-25. Numrich does not teach a method of producing a polycarbonate sheet, let alone a multiwall polycarbonate sheet. Numrich is cited for his teaching of melt filtration. 06/22/2007 Office Action, page 3, first full paragraph.

Applicants respectfully assert that their claims are patentable over the Vetter, McCloskey and Numrich for at least two reasons. First, a prima facie case of obviousness has not been established because a POSITA working at the time of Applicants' invention would avoid the use of McCloskey's polycarbonate in Vetter's multiwall sheet process. Second, Applicants have demonstrated unexpected results sufficient to rebut a prima facie case of obviousness, and their claims are now commensurate with these unexpected results.

1. A POSITA Practicing Vetter's Multiwall Sheet Method Would Avoid
McCloskey's Polycarbonate Because of Its Reduced Branching.

Applicants respectfully assert that a prima facie case of obviousness has not been

established because a person of ordinary skill in the art (POSITA) would avoid using McCloskey's polycarbonate in Vetter's multiwall sheet process.

Although the Supreme Court's recent decision in *KSR Int'l. Co. v. Teleflex Inc.* rejected rigid application of the teaching, suggestion, or motivation (TSM) test, it acknowledged the importance of identifying "a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." *KSR Int'l. Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007).

Here, a POSITA would not be prompted to combine McCloskey's polycarbonate with Vetter's multiwall sheet method. Specifically, a POSITA would understand that high melt strength is critical to the formation of multiwall sheet. As Applicants state in the Background section of their Application, "To ensure that the multiwall sheet does not collapse before cooling, polycarbonate resin having a high melt strength must be used." A POSITA would also understand that high melt strength in a polycarbonate is typically achieved by intentionally increasing the degree of branching in the polycarbonate chain. Again, Applicants acknowledge this in the Background section of their application:

In practice, this has been achieved by using branched polycarbonates prepared by introducing branching agents into the so-called interfacial method. In the interfacial method for polycarbonate synthesis, an aqueous solution of a dihydric phenol (e.g., bisphenol-A) is combined with an organic solvent (e.g., dichloromethane) containing a carbonyl halide (e.g., phosgene).

Present application, page 1, paragraph [0002]. A POSITA would therefore understand that McCloskey's reduction of Fries product and other branched side reaction products (McCloskey, column 2, lines 47-50) would reduce the melt strength of McCloskey's melt polycarbonate relative to other melt polycarbonates and thus reduce its utility in a multiwall sheet process. Accordingly, a POSITA would avoid McCloskey's polycarbonate for use in a multiwall sheet process.

In response to related arguments made in Applicants' 08/02/2007 Response, the Examiner has stated, in part,

McCloskey discloses a melt-polymerized polycarbonate and states in the reference that it is suitable for use in sheet products. More importantly, the polycarbonate of McCloskey provides the benefits of melt-polymerized polycarbonates (col. 1, lines 42-51) while eliminating the typical higher Fries content of melt polymerized polycarbonates, thereby yielding a product with better or non-degraded rheological properties (col. 2, lines 41-col. 3, lines 40) which is very desirable in polycarbonate (col. 3, lines 34-40).

08/23/07 Advisory Action, page 2. However, the better or non-degraded rheological properties touted by McCloskey would be irrelevant to a POSITA who expects that a multiwall sheet could not be formed with McCloskey's polycarbonate, and that is exactly what a POSITA would expect based on the reduced branching of McCloskey's polycarbonate. Applicants therefore respectfully assert that the Examiner's argument ignores a critical difference between single-wall and multiwall sheet (the criticality of high melt strength in the formation of multiwall sheet), and that the known preference for branched polycarbonates for use in formation of multiwall sheet would cause a POSITA to avoid using McCloskey's polycarbonate with reduced branching in Vetter's multiwall sheet. Accordingly, a prima facie case of obviousness has not been established.

2. Applicants Have Demonstrated Unexpected Results

Even if a prima facie case of obviousness had been established, Applicants respectfully assert that they have demonstrated unexpected results sufficient to rebut a prima facie case of obviousness, and that their claims are now commensurate with these unexpected results.

"The basic principle behind this rule [of unexpected results] is straightforward – that which would have been surprising to a person of ordinary skill in a particular art would not have been obvious." *In re Soni*, 34 U.S.P.Q.2d 1685, 1687 (Fed. Cir. 1995). "[W]hen an applicant demonstrates *substantially* improved results . . . and *states* that the results were *unexpected*, this should suffice to establish unexpected results *in the absence* of evidence to the contrary." *Id.* at 1688.

All of Applicants' independent claims have been amended to include the cross-sheet uniformity limitation, "wherein the multiwall thermoplastic sheet comprises a

plurality of sections having a relative standard deviation in mass per unit area of less than about 2%". And Applicants' working examples demonstrate that this cross-sheet uniformity has been achieved. See, especially, relative standard deviations of 1.25%, 1.02%, and 1.18% for three multiwall sheets formed from a low-Fries polycarbonate in Example 1, compared to relative standard deviations of 6.48%, 4.54%, and 6.74% for three multiwall sheets formed from a high-Fries polycarbonate in Comparative Example 2. Present Application, Table 3, page 18. Applicants respectfully submit that it is quite unexpected that a multiwall sheet prepared from a melt polycarbonate resin having a Fries content of about 10 ppm to about 2000 ppm – and therefore a relatively low degree of branching – would exhibit much better cross-sheet uniformity than a multiwall sheet prepared from a melt polycarbonate having a higher Fries content – and therefore a relatively higher degree of branching. Applicants have therefore demonstrated an unexpected and substantial improvement in the cross-sheet uniformity of a multiwall sheet by using a melt polycarbonate resin having a Fries content of about 10 ppm to about 2000 ppm. Applicants' selection of a low-Fries polycarbonate runs counter to the conventional wisdom that more highly branched polycarbonates are better for a multiwall sheet process because of their higher melt strength. Accordingly, Applicants' independent claims are not obvious over the combination of Vetter and McCloskey. The addition of Numrich, which was cited for its melt filtration feature, does not change this conclusion.

3. Summary

Applicants respectfully assert that a prima facie case of obvious has not been established because a POSITA would avoid McCloskey's polycarbonate for use in a multiwall sheet process, and that even if a prima facie case of obviousness has been established, Applicants have provided unexpected results sufficient to rebut the prima facie case. Accordingly, and in view of the present cancellation of claim 19, Applicants respectfully request the reconsideration and withdrawal of the rejection of claims 1, 4-11, 13-15, 18, 20, 23, 24, and 27 under 35 U.S.C. § 103(a) over Vetter in view of McCloskey and Numrich.

Obviousness Rejection over Vetter + McCloskey + Numrich + Mestanza

Claims 16 and 17 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Vetter in view of McCloskey and Numrich, and further in view of U.S. Patent No. 6,124,422 to Mestanza ("Mestanza"). 06/22/2007 Office Action, page 5, first paragraph. Applicants respectfully traverse this rejection to the extent it may be applicable to the claims as currently amended.

Vetter, McCloskey, and Numrich are discussed above.

Mestanza generally describes a method of quenching a polycarbonate-forming melt reaction of a diaryl carbonate and a dihydric phenol in the presence of a basic catalyst. Mestanza abstract. The quenching composition contains an acidic quencher, such as an alkyl tosylate, in a non-powder carrier. *Id.* According to the Examiner, "Mestanza discloses that it is known in the art of producing polycarbonate to add additives as a mixture and/or as a compacted blend." 06/22/2007 Office Action, page 5, second paragraph.

Like Numrich, Mestanza does not alter the conclusion that a POSITA would avoid the use of McCloskey's polycarbonate in Vetter's multiwall sheet method. Therefore, a prima facie case of obviousness based on Vetter, McCloskey, Numrich, and Mestanza has not been established. And, even if a prima facie case of obviousness had been established, Applicants have demonstrated unexpected results sufficient to rebut a prima facie case. Claims 16 and 17, which depend ultimately from and further limit claim 1, are therefore patentable over Vetter in view of McCloskey and Numrich and further in view of Mestanza. Applicants therefore respectfully request the reconsideration and withdrawal of the rejection of claims 16 and 17 under 35 U.S.C. § 103(a) over Vetter in view of McCloskey and Numrich and further in view of Mestanza.

Obviousness Rejection over Vetter + McCloskey + Numrich + Rosato

Claim 22 stands rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Vetter in view of McCloskey and Numrich, and further in view of Rosato (Extruding Plastics-A Practical Processing Handbook). 06/22/2007 Office Action, page 5, fourth

paragraph. Applicants respectfully traverse this rejection to the extent it may be applicable to the claims as currently amended.

Vetter, McCloskey, and Numrich are discussed above.

Rosato is cited as teaching a polycarbonate processing temperature of 280-310°C and adjustment of thermoplastic extrusion temperature to eliminate surging, gel formation, and melt fracture. 06/22/2007 Office Action, paragraph bridging pages 5 and 6.

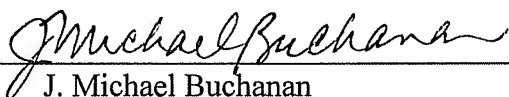
Like Numrich and Mestanza, Rosato does not alter the conclusion that a POSITA would avoid the use of McCloskey's polycarbonate in Vetter's multiwall sheet method. Therefore, a prima facie case of obviousness based on Vetter, McCloskey, Numrich, and Rosato has not been established. And, even if a prima facie case of obviousness had been established, Applicants have demonstrated unexpected results sufficient to rebut a prima facie case. Claim 22, which depends ultimately from and further limits claim 1, is therefore patentable over Vetter in view of McCloskey and Numrich and further in view of Rosato. Applicants therefore respectfully request the reconsideration and withdrawal of the rejection of claim 22 under 35 U.S.C. § 103(a) over Vetter in view of McCloskey and Numrich and further in view of Rosato.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance is respectfully requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 50-3621 maintained by Assignee.

Respectfully submitted,

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